Overcoming Design Challenges in Specialty Displays and Applications

Cathy Getz
VP of Engineering & Product Development
Let’s Talk Hardware

What We Will Cover…

Touch International Background

The Important Questions

Touch Technology Issues

Designing for High Performance

Display Enhancement Options

Display Enhancements in Action

© Copyright 2012 Touch International, Inc
At a Glance

Who We Are
- Original Producer of Projected Capacitive
- Complementary Facilities in U.S. and Asia
- Largest Touch Manufacturer in North America

What We Do
- Touch Screen Manufacturing
- Electronic Display Enhancements
- Cover Glass & Enhancement Windows

Markets Served
- Military
- Medical
- Retail
- Aerospace
- Transportation
- Industrial
Products and Services Overview

Ruggedization

Optical Performance

Functionality

Analog Resistive

Custom Solutions

Projected Capacitive

Touch Screens
Controllers, Firmware
Value-Added Services
Display Enhancements
Windows, Cover Glass

© Copyright 2012 Touch International, Inc
So you want to build a display for a specialized application?
Specialized Applications

What Applications Are We Talking About?

Medical  Military  Aerospace  Industrial

© Copyright 2012 Touch International, Inc
What You Should Know...
First Step

Plan Your Project

Questions to ask before building touch into your product...

Project – What are your objectives?
Design – What’s the look you’re going for?
Function – Do you want any special features?
Input – Do you need finger, pen, or gloved touch?
Timeline – What’s your time-to-market?
Environment – What kinds of conditions will it be exposed to?
Requirements – Are there industry regulations that need to be addressed?
Cost – What’s your budget?
Choose Your Display

Think about your LCD, LED or OLED Display...

Top Factors to Consider for Specialty Designs

Environment – Where and how will the product be used?
- Continuous use, outdoors, extreme temperatures, high altitudes

Quality – Is the product consistent and reliable?

Noise – Does the LCD emit additional noise? Is this a potential issue?
Identify Your Requirements

Identifying Key Touch Requirements

Size – What screen size does your application require?
Input Method – Finger, Stylus, Glove?
Number of Points – Single-Touch, Dual-Touch, Multi-Touch?
Environment – What conditions will it be subjected to?
Durability – How long does it need to last?
Complexity – Do I need a standard or custom product?
Regulatory Restrictions – What are the industry regulations?
Availability – Will it be available in the future?
Cost – Does the cost fit in my budget?
Touch Technology Limitations

So you want your product to work like the iPhone...

Aspects to consider when choosing projected capacitive:

**Design** – Custom designs often very complex, may take longer to build

**Size** – Expensive to scale larger than 22”

**Interference** – Prone to noise and may require EMI shielding

**Integration** – More complex than older technologies

**Cost** – More expensive than older technologies
Think resistive is the right choice for you?

Even veteran technologies have limitations…

Size – Difficult to scale larger than 26”

Maintenance – Periodic recalibration is required

Touch Input – Requires pressure to recognize touch

Optics – Light transmission is low
  - Resistive - <83% (Typical)  Projected Capacitive - >92% (Typical)

Durability – Impacted due to flexibility of layers

Bezel – Required to encase the touch screen and display
Other Considerations

The Electronics

TI’s New Multi-Touch Ultra-Thin PCB Controller with Added Noise Resistance Should be Considered for Specialty PCAP Displays

Why?

- Minimizes Noise and Interference
- Reduces Chances of Data Breakdown
- Shorter Time to Market Than Custom Design
- Provides Strong Durability only Found in PCB Controllers
- Lower Cost Than Chip-on-Flex
Display Enhancements Play an Important Role
Designing for Specialty Displays

Touch Screen + Enhancements = Total Display Solution

Adding Display Enhancements

- Conquers Environmental Challenges
- Improves Performance
- Extends Display Life

Enhancements Improve

- Optical Performance
- Mechanical Durability
- EMI/RFI Emissions
- Thermal Operating Ranges
Display Enhancements

- Anti-Smudge
- Anti-Reflection
- Touch Screen
- RFID ID Reader
- Color Filter
- Light Control Film
- EMI Filter
- Cover Glass
- Bullet Proof Glass

- Reduces Fingerprint on Anti-Reflective Coatings
- Better Sunlight Readability and Light Transmission
- Projected Capacitive Surface Capacitive Multi-Touch Resitive (MAIRS) Analog Resistive Pen Inpl.t
- NVIS Persistence Blackout
- Reduces Electric Noise Stealth
- Anti-Glare Gorilla Glass Color Decoration Holes / Slots Camera Filters Chemically Strengthened

- Polarizer
- Transparent Heater
- Heat Mirror
- Optical Bond
- Privacy Filter
- LCD
- Brightness Enhancement
- LED Backlight
- Haptic Response

- Sunlight Readable
- Heats Up For Cold Weather
- Reflects IR Heat
- Ruggedize
- Security / Privacy
- Makes Display Brighter
- Sunlight Readable Low Temperature

© Copyright 2012 Touch International, Inc
Designing for Specialty Displays

Tackling Tough Application Requirements

Some industries have stringent requirements that require multiple enhancements.

- Aerospace – HIC Compliant, Self-Extinguishing, Low Toxicity
- Military - NVIS Compliant, EMI Shielding, High-Temperature Tolerant
- Medical - NEMA Sealable, Anti-Microbial, Shatterproof, EMI
Designing for Specialty Displays

Military Application Requirements

- Extreme Outdoor Environments
- Advanced Sunlight Readability
- Optimized Video & Light Images
- NVIS (Night Vision Imaging System) Compliant
Designing for Specialty Displays

Enhancements Are Not Just for Touch...

All enhancements (including cover glass) can be placed onto glass or polycarbonate LCD overlays.

Why would one need an enhancement overlay?

- Suppress EMI on an Airplane LCD
- Restrict images on an ATM LCD
- Reduce glare on outdoor display
- Add custom cover glass for a flush bezel-less finish
To Summarize

- Plan Your Display!
- Explore Your Touch Options
- Determine Potential Technology Issues
- Identify Industry Regulations
- Use Display Enhancements & Value-Add Solutions to Improve Display Performance
Questions?

Cathy Getz
VP of Engineering &
Product Development
cgetz@touchintl.com
www.touchinternational.com